

Full Spectrum Color Detecting Pixel Camera

b. separately directing the spectral energy element of each pixel to a spectral energy dispersion device that spreads the energy function into a continuous spectrum representative of an entire spectrum of interest; and

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c. for each pixel, functioning as a spectrum analyzer, determining an amplitude value for each of the resolved spectral components.

10 2. In a further related embodiment, the spectral energy dispersion device in claim 1 is implemented as part of a spectrophotometer.

3. In an additional related embodiment, determining an amplitude value for each of the spectral components in claim 1 includes using a linear array of photo-detectors to evaluate the output of the spectrophotometer.

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4. In a further related embodiment in claim 3 a modulated flexible grating is utilized to detect smaller wavelength bandwidth by jittering or stressing the grating.

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These embodiments are capable of capturing the entire spectral energy content of a scene imaged onto the pixel sensors. The spectrum covered, depending on the parameters of the spectral separator and spectrophotometer described herein, may span from the x-ray region, through the ultraviolet, the visible, to the far infrared. Other related embodiments include an apparatus that implements
25 the above methods.